National Coral Reef Monitoring Program: Water Chemistry of the Coral Reefs in the Hawaiian Archipelago from Water Samples collected since 2013

Pacific Islands Fisheries Science Center

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Project (PRJ) | ID: 32954

ID: 36067
Data Set (DS)

*** Discovery**
• First Pass
» Metadata Rubric

Item Identification

*** » Title**	National Coral Reef Monitoring Program: Water Chemistry of the Coral Reefs in the Hawaiian Archipelago from Water Samples collected since 2013
Short Name	NCRMP: Water Chemistry Hawaiian Archipelago
*** Status**	In Work
*** » Abstract**	Water samples are collected and analyzed to assess spatial and temporal variation in the seawater carbonate systems of coral reef ecosystems in the Hawaiian and Mariana Archipelagos, American Samoa, and the Pacific Remote Island Areas as part of the NOAA National Coral Reef Monitoring Program (NCRMP). Laboratory experiments reveal calcification rates of crustose coralline algae (CCA) are strongly correlated to seawater aragonite saturation state. Predictions of reduced coral calcification rates, due to ocean acidification, suggest that coral reef communities will undergo ecological phase shifts as calcifying organisms are negatively impacted by changing seawater chemistry. The data described here are from water samples collected at existing, long-term monitoring sites during NOAA Pacific Islands Fisheries Science Center (PIFSC), Coral Reef Ecosystem Program (CREP) led NCRMP missions around the Hawaiian Archipelago since 2013. Two water samples are typically collected from each site—one at the reef and one at the surface directly above the reef—and a third sample may also be collected approximately 1 km offshore from the site. The samples are processed by CREP and sent to NOAA Pacific Marine Environmental Laboratory (PMEL) to be analyzed for total alkalinity (TA) and dissolved inorganic carbon (DIC). From these constituents, alongside temperature, salinity, and depth data, other constituents of the seawater carbonate system can be calculated. These monitoring data provide a baseline for tracking reef carbonate system changes due to globally increasing levels of atmospheric carbon dioxide. The data can be accessed online via the NOAA National Centers for Environmental Information (NCEI) Ocean Archive.
*** Purpose**	The NOAA National Coral Reef Monitoring Program (NCRMP) details a long term approach to provide an ecosystem perspective via monitoring climate, fish, benthic, and socioeconomic variables in a consistent and integrated manner. The NCRMP is intended to coordinate various NOAA Coral Reef Conservation Program (CRCP) biological, physical, and human dimensions activities into a cohesive NOAA-wide effort. Through the implementation of the NCRMP, NOAA will be able to clearly and concisely communicate results of national-scale monitoring to national, state, and territorial policy makers, resource managers, and the public on a periodic basis.

	To support a long-term Coral Reef Conservation Program for sustainable management and conservation of coral reef ecosystems and the NOAA Ocean Acidification Program (OAP), total alkalinity and dissolved inorganic carbon are measured to calculate various inorganic carbon system parameters that influence coral reef ecosystems monitored by the NOAA Coral Reef Ecosystem Program (CREP). SCUBA divers take discrete water samples at the benthos and at the surface at forereef study sites established by the ongoing Pacific Reef Assessment and Monitoring Program (RAMP).
Notes	
Other Citation Details	
• Supplemental Information	The National Coral Reef Monitoring Program (NCRMP) is a framework for conducting sustained observations of biological, climate, and socioeconomic indicators at 10 priority coral reefs across the U.S. and its territories. This integrated approach will consolidate monitoring of coral reefs under a uniform method in the Pacific, Atlantic, Caribbean, and the Gulf of Mexico for the first time. NCRMP is funded by the CRCP and supported by NOAA Fisheries, NOAA National Centers for Coastal Ocean Science (NCCOS), and many other partners. The Coral Reef Ecosystem Program (CREP) at NOAA Fisheries is leading ocean and climate change monitoring in the U.S. Pacific Islands Region. The climate component of NCRMP in the Pacific provides a comprehensive view of climate change impacts on coral reef ecosystems and helps identify areas of resilience and vulnerability. The key indicators used to identify and monitor climate-driven trends include 1) thermal stress caused by changes in sea temperature, 2) ocean acidification resulting from changes in carbonate chemistry, and 3) ecological impacts by collecting data on coral growth rates, erosion, and community structure to understand the impacts of thermal stress and ocean acidification on the ecosystem. Each year, CREP scientists work closely with CRCP and partners during Reef Assessment and Monitoring Program (RAMP) missions to collect data using moored oceanographic (subsurface temperature recorders) and ecological (calcification accretion units [CAUs] and autonomous reef monitoring structures [ARMS]) instruments stationed at fixed sites in the Pacific Ocean, and water samples collected by divers. The in-situ data and satellite-based observations are also used in modeling efforts. Innovative analysis techniques are used to develop products that give fellow scientists, managers, decision makers and the public a better understanding of a region's resources and how they are changing over time.

Keywords

Theme Keywords

Thesaurus	Keyword
CoRIS Discovery Thesaurus	Numeric Data Sets > Water Quality
CoRIS Theme Thesaurus	EARTH SCIENCE > Biosphere > Aquatic Habitat > Reef Habitat
CoRIS Theme Thesaurus	EARTH SCIENCE > Biosphere > Zoology > Corals > Reef Monitoring and Assessment
CoRIS Theme Thesaurus	EARTH SCIENCE > Oceans > Coastal Processes > Coral Reefs
CoRIS Theme Thesaurus	EARTH SCIENCE > Oceans > Ocean Chemistry > Alkalinity
CoRIS Theme Thesaurus	EARTH SCIENCE > Oceans > Ocean Chemistry > Carbon Dioxide
CoRIS Theme	EARTH SCIENCE > Oceans > Ocean Chemistry > Carbonate Chemistry

Thesaurus	
CoRIS Theme Thesaurus	EARTH SCIENCE > Oceans > Ocean Chemistry > Chemistry Monitoring and Assessment
CoRIS Theme Thesaurus	EARTH SCIENCE > Oceans > Ocean Chemistry > Dissolved Gases
CoRIS Theme Thesaurus	EARTH SCIENCE > Oceans > Ocean Chemistry > Inorganic Carbon
CoRIS Theme Thesaurus	EARTH SCIENCE > Oceans > Ocean Chemistry > Ocean Acidification
CoRIS Theme Thesaurus	EARTH SCIENCE > Oceans > Ocean Chemistry > pH
CRCP Project	587
CRCP Project	743
CRCP Project	National Coral Reef Monitoring Program
CRCP Project	Pacific Reef Assessment and Monitoring Program: Monitoring coral reef ecosystems of the US Pacific Islands and Atolls
ISO 19115 Topic Category	014
ISO 19115 Topic Category	Oceans
NODC DATA TYPES THESAURUS	Conductivity
NODC DATA TYPES THESAURUS	DEPTH - OBSERVATION
NODC DATA TYPES THESAURUS	DISSOLVED INORGANIC CARBON (DIC)
NODC DATA TYPES THESAURUS	PRESSURE - WATER
NODC DATA TYPES THESAURUS	SALINITY
NODC DATA TYPES THESAURUS	TOTAL ALKALINITY (TA)
NODC DATA TYPES THESAURUS	WATER DENSITY
NODC DATA TYPES THESAURUS	WATER TEMPERATURE
NODC Observation Types Thesaurus	water chemistry
NODC Platform Names Thesaurus	HI'IALAKAI

NODC Platform Names Thesaurus	OSCAR ELTON SETTE
NODC Project Names Thesaurus	Coral Reef Conservation Program
NODC Project Names Thesaurus	CORAL REEF STUDIES
NODC Project Names Thesaurus	National Coral Reef Monitoring Program
NODC Project Names Thesaurus	Ocean Acidification Program
NODC Project Names Thesaurus	Pacific Reef and Assessment Monitoring Program
NODC Submitting Institution Names Thesaurus	US DOC; NOAA; NMFS; Pacific Islands Fisheries Science Center; Ecosystem Sciences Division; Coral Reef Ecosystem Program
None	Coral Reef Ecosystem Division
None	Coral Reef Ecosystem Program
None	CRED
None	CREP
None	Pacific Islands Fisheries Science Center
None	PIFSC
None	RAMP
None	Reef Assessment and Monitoring Program

Temporal Keywords

Thesaurus	Keyword
None	Triennial

* Spatial Keywords

Thesaurus	Keyword
CoRIS Place Thesaurus	COUNTRY/TERRITORY > United States of America > Hawaii > Hawaii > Hawaii (21N160W0000)

CoRIS Place Thesaurus	COUNTRY/TERRITORY > United States of America > Hawaii > Hawaii > Hawaii Island (19N155W0003)
CoRIS Place Thesaurus	COUNTRY/TERRITORY > United States of America > Hawaii > Hawaii > Kauai Island (22N159W0001)
CoRIS Place Thesaurus	COUNTRY/TERRITORY > United States of America > Hawaii > Hawaii > Molokai Island (21N157W0001)
CoRIS Place Thesaurus	COUNTRY/TERRITORY > United States of America > Hawaii > Honolulu > French Frigate Shoals (24N166W0001)
CoRIS Place Thesaurus	COUNTRY/TERRITORY > United States of America > Hawaii > Honolulu > Kure Atoll (28N178W0001)
CoRIS Place Thesaurus	COUNTRY/TERRITORY > United States of America > Hawaii > Honolulu > Lisianski Island (25N173W0001)
CoRIS Place Thesaurus	COUNTRY/TERRITORY > United States of America > Hawaii > Honolulu > Maro Reef (25N170W0001)
CoRIS Place Thesaurus	COUNTRY/TERRITORY > United States of America > Hawaii > Honolulu > Northwestern Hawaiian Islands (28N178W0000)
CoRIS Place Thesaurus	COUNTRY/TERRITORY > United States of America > Hawaii > Honolulu > Oahu (21N157W0003)
CoRIS Place Thesaurus	COUNTRY/TERRITORY > United States of America > Hawaii > Honolulu > Pearl and Hermes Reef (27N176W0001)
CoRIS Place Thesaurus	COUNTRY/TERRITORY > United States of America > Hawaii > Kauai > Niihau Island (21N160W0001)
CoRIS Place Thesaurus	COUNTRY/TERRITORY > United States of America > Hawaii > Maui > Lanai Island (20N156W0002)
CoRIS Place Thesaurus	COUNTRY/TERRITORY > United States of America > Hawaii > Maui > Maui Island (20N156W0004)
CoRIS Place Thesaurus	COUNTRY/TERRITORY > United States of America > Hawaiian Islands (21N157W0027)
CoRIS Place Thesaurus	OCEAN BASIN > Pacific Ocean > Central Pacific Ocean > Hawaiian Islands (21N157W0027)
CoRIS Place Thesaurus	OCEAN BASIN > Pacific Ocean > Central Pacific Ocean > Hawaiian Islands > Hawaii > Hawaii (21N160W0000)
CoRIS Place Thesaurus	OCEAN BASIN > Pacific Ocean > Central Pacific Ocean > Hawaiian Islands > Hawaii Island > Hawaii Island (19N155W0003)
CoRIS Place Thesaurus	OCEAN BASIN > Pacific Ocean > Central Pacific Ocean > Hawaiian Islands > Kauai Island > Kauai Island (22N159W0001)
CoRIS Place Thesaurus	OCEAN BASIN > Pacific Ocean > Central Pacific Ocean > Hawaiian Islands > Lanai Island > Lanai Island (20N156W0002)
CoRIS Place Thesaurus	OCEAN BASIN > Pacific Ocean > Central Pacific Ocean > Hawaiian Islands > Maui Island > Maui Island (20N156W0004)
CoRIS Place Thesaurus	OCEAN BASIN > Pacific Ocean > Central Pacific Ocean > Hawaiian Islands > Molokai Island > Molokai Island (21N157W0001)

CoRIS Place Thesaurus	OCEAN BASIN > Pacific Ocean > Central Pacific Ocean > Hawaiian Islands > Niihau Island > Niihau Island (21N160W0001)
CoRIS Place Thesaurus	OCEAN BASIN > Pacific Ocean > Central Pacific Ocean > Hawaiian Islands > Oahu Island > Oahu (21N157W0003)
CoRIS Place Thesaurus	OCEAN BASIN > Pacific Ocean > Central Pacific Ocean > Northwestern Hawaiian Islands (28N178W0000)
CoRIS Place Thesaurus	OCEAN BASIN > Pacific Ocean > Central Pacific Ocean > Northwestern Hawaiian Islands > French Frigate Shoals (24N166W0001)
CoRIS Place Thesaurus	OCEAN BASIN > Pacific Ocean > Central Pacific Ocean > Northwestern Hawaiian Islands > Kure Atoll (28N178W0001)
CoRIS Place Thesaurus	OCEAN BASIN > Pacific Ocean > Central Pacific Ocean > Northwestern Hawaiian Islands > Lisianski Island (25N173W0001)
CoRIS Place Thesaurus	OCEAN BASIN > Pacific Ocean > Central Pacific Ocean > Northwestern Hawaiian Islands > Maro Reef (25N170W0001)
CoRIS Place Thesaurus	OCEAN BASIN > Pacific Ocean > Central Pacific Ocean > Northwestern Hawaiian Islands > Pearl and Hermes Reef (27N176W0001)
NODC Sea Area Names Thesaurus	North Pacific Ocean
NODC Sea Area Names Thesaurus	Papahanaumokuakea Marine National Monument
None	Main Hawaiian Islands
None	MHI
None	Northwestern Hawaiian Islands
None	NWHI

Stratum Keywords

Thesaurus	Keyword

Physical Location

• » **Organization**	Pacific Islands Fisheries Science Center
• » **City**	Honolulu
• »	HI

State/Province	
• Country	USA
• » Location Description	

Data Set Information

• Data Set Type	CSV Files
• Maintenance Frequency	As needed
• Data Set Publication Status	Published
• Data Set Publication Date	2016
» Data Presentation Form	Table (digital)
Source Media Type	Online
• Entity Attribute Overview	A data dictionary describing each column provided in the data set is included in the NCEI archive package as a comma-separated file. The columns provided in the dataset include: Year, RegionCode, Location, REA_Site, Cruise, ShallowCTDID, CastType, Latitude, Longitude, UTCDateTime, Sample_Depth_(m), DIC, DIC_QC, TA, TA_QC, Conductivity_S/m, Salinity_PSU, Temperature_DegC, Pressure_db, and Density_Sigmat.
Entity Attribute Detail Citation	
Entity Attribute Detail URL	http://accession.nodc.noaa.gov/accession#
Distribution Liability	While every effort has been made to ensure that these data are accurate and reliable within the limits of the current state of the art, NOAA cannot assume liability for any damages caused by errors or omissions in the data, nor as a result of the failure of the data to function on a particular system. NOAA makes no warranty, expressed or implied, nor does the fact of distribution constitute such a warranty.
Data Set Credit	PIFSC Coral Reef Ecosystem Program and partners
» Instrument	Not applicable
» Platform	Not applicable
» Physical Collection / Fishing Gear	Niskin bottles

Support Roles

» At least one Distributor Org, one Metadata Contact, one Point of Contact, and one Data Steward should be listed.

*** » Support Role**	Data Steward

*** » Date Effective From**	2013
Date Effective To	Present
*** » Person**	Charles W Young
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Fax	
Business Hours	
*** Organization**	Pacific Islands Fisheries Science Center (PIFSC)
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Organization Phone	808-725-5300
Organization URL	http://www.pifsc.noaa.gov
Organization Business Hours	8:00 a.m. - 4:30 p.m.
Contact Instructions	Email preferred

*** » Support Role**	Distributor
*** » Date Effective From**	2015-11-16
Date Effective To	Present
*** » Person**	Brian Beck
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Business Hours	
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Organization	NOAA/NESDIS E/OC SSMC3, 4th Floor, 1351 East-West Highway

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Organization Phone	(301) 713-3277
Organization Business Hours	
Contact Instructions	Email preferred

*** » Support Role**	Distributor
*** » Date Effective From**	2013
Date Effective To	2015-11-15
*** » Person**	Kevin L Trick
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Contact Instructions	Email preferred

*** » Support Role**	Metadata Contact
*** » Date Effective From**	2013
Date Effective To	Present
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Organization Address:	1845 Wasp Blvd. Honolulu, HI 96818 USA
Organization Phone	808-725-5300
Organization URL	http://www.pifsc.noaa.gov
Organization Business Hours	8:00 a.m. - 4:30 p.m.
Contact Instructions	Email preferred

*** » Support Role**	Originator
*** » Date Effective From**	2013
Date Effective To	Present
*** Organization**	NOAA Coral Reef Conservation Program (CRCP) (CRCP)
Organization Address:	1305 East West Highway 10th Floor Silver Spring, MD 20910-3281
Organization Phone	(301) 713-3155
Organization URL	http://coralreef.noaa.gov
Organization Business Hours	
Contact Instructions	

*** » Support Role**	Originator
*** » Date Effective From**	2013

Date Effective To	Present
*** Organization**	Pacific Islands Fisheries Science Center (PIFSC)
Organization Address:	1845 Wasp Blvd. Honolulu, HI 96818 USA
Organization Phone	808-725-5300
Organization URL	http://www.pifsc.noaa.gov
Organization Business Hours	8:00 a.m. - 4:30 p.m.
Contact Instructions	

*** » Support Role**	Point Of Contact
*** » Date Effective From**	2015
Date Effective To	Present
*** » Person**	Thomas Oliver
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Phone Number	(808)725-5444
Fax	
Business Hours	
*** Organization**	Pacific Islands Fisheries Science Center (PIFSC)
Organization Address:	1845 Wasp Blvd. Honolulu, HI 96818 USA
Organization Phone	808-725-5300
Organization URL	http://www.pifsc.noaa.gov
Organization Business Hours	8:00 a.m. - 4:30 p.m.
Contact Instructions	Email preferred

*** » Support Role**	Point Of Contact
*** » Date Effective From**	2013
Date Effective To	2014
*** » Person**	Charles W Young
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*** » Email Address**	charles.young@noaa.gov
Phone Number	
Fax	
Business Hours	
*** Organization**	Pacific Islands Fisheries Science Center (PIFSC)
Organization Address:	1845 Wasp Blvd. Honolulu, HI 96818 USA
Organization Phone	808-725-5300
Organization URL	http://www.pifsc.noaa.gov
Organization Business Hours	8:00 a.m. - 4:30 p.m.
Contact Instructions	Email preferred

*** » Support Role**	
*** » Date Effective From**	
Date Effective To	
*** » Person**	
*** and/or Organization**	
*** Contact Instructions**	

*** » Support Role**	
*** » Date Effective From**	

Date Effective To	
*** » Person**	
*** and/or Organization**	
*** Contact Instructions**	

*** » Support Role**	
*** » Date Effective From**	
Date Effective To	
*** » Person**	
*** and/or Organization**	
*** Contact Instructions**	

Extents

Currentness Reference	Ground Condition

Extent Group 1

Extent Description	Hawaiian Archipelago including the main Hawaiian Islands (Hawaii, Kauai, Maui, Oahu, Molokai, Niihau, and Lanai), and the Northwestern Hawaiian Islands (French Frigate Shoals, Lisianski, Pearl and Hermes, and Kure).

Extent Group 1 / Geographic Area 1

*** » W° Bound**	-178.3864304
*** » E° Bound**	-154.8175912
*** » N° Bound**	28.46040001
*** » S° Bound**	18.92598792
*** » Description**	

Extent Group 1 / Vertical Extent

Vertical Minimum	

Vertical Maximum	
Coordinate Reference System URL	

Extent Group 1/Time Frame 1

*** » Time Frame Type**	Range
*** » Start**	2013-10-18
End	2013-10-30
Alternate Start As Of Info	SB1320
Alternate End As Of Info	
Description	MHI RAMP 2013, Shore-based surveys on Oahu

Extent Group 1/Time Frame 2

*** » Time Frame Type**	Range
*** » Start**	2013-07-13
End	2013-07-14
Alternate Start As Of Info	SE1305
Alternate End As Of Info	
Description	NWHI RAMP 2013, piggy-back mission, Kure

Extent Group 1/Time Frame 3

*** » Time Frame Type**	Range
*** » Start**	2013-08-02
End	2013-08-22
Alternate Start As Of Info	HA1304
Alternate End As Of Info	

Description	MHI RAMP 2013

Extent Group 1 / Time Frame 4

*** » Time Frame Type**	Range
*** » Start**	2013-09-05
End	2013-09-18
Alternate Start As Of Info	HA1305
Alternate End As Of Info	
Description	NWHI RAMP 2013

Extent Group 1 / Time Frame 5

*** » Time Frame Type**	Range
*** » Start**	2015-07-31
End	2015-08-19
Alternate Start As Of Info	
Alternate End As Of Info	
Description	Dates water samples were collected during the Reef Assessment and Monitoring Program (RAMP) mission led by the Papahanaumokuakea Marine National Monument program in 2015

Access Information

*** » Security Class**	Unclassified
*** Security Classification System**	Not applicable
Security Handling Description	Not applicable
• Data Access Policy	Coral Reef Ecosystem Program (CREP) Data Sharing Recommendations, version 9.0 updated August 12, 2015: CREP welcomes the opportunity to collaborate on research issues contributing to the scientific basis for better management of marine ecosystems. CREP has a very diverse set of field activities that generates

	large volumes of data using an array of data collection protocols. The following recommendations are for your consideration as you use this data: 1) Data analyses should take all field exigencies into account. The most effective way to do this would be active collaboration with CREP principal investigators. 2) In all presentations, product releases, or publications using data generated by CREP, proper acknowledgement of both CREP and the individuals responsible for data collection is expected. Citing the DOI (if available) is preferred, a non-DOI example is listed below. 3) If you collect or generate data for the same study areas, CREP requests that you share relevant information on complimentary data collections. 4) Those receiving data are strongly urged to inform the CREP Data Management Team of any errors and discrepancies that are discovered during the course of using these data. They are further urged to bring to the attention of the Team all problems and difficulties encountered in using these data. This information is necessary in order to improve the collections and to facilitate more efficient and economical data processing and retrieval. The users are asked to supply copies of any missing data that may be located, and to provide information as to significant subsets and special aggregations of data that are developed in using the material provided. Example citation: "This publication makes use of data products provided by the Coral Reef Ecosystem Program (CREP), Pacific Islands Fisheries Science Center (PIFSC), National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), with funding support from the NOAA Coral Reef Conservation Program (CRCP) and the NOAA Ocean Acidification Program. The analysis and interpretations presented here are solely that of the current authors"
» Data Access Procedure	Data can be accessed online via the NOAA National Centers for Environmental Information (NCEI) Ocean Archive.
• » Data Access Constraints	None
• Data Use Constraints	Please cite NOAA Coral Reef Ecosystem Program (CREP) when using the data. Suggested Citation: Coral Reef Ecosystem Program; Pacific Islands Fisheries Science Center (2016). National Coral Reef Monitoring Program: Water Chemistry of the Coral Reefs in the Hawaiian Archipelago from Water Samples collected since 2013. NOAA's National Center for Environmental Information, https://inport.nmfs.noaa.gov/inport/item/36067.
Metadata Access Constraints	None
Metadata Use Constraints	None

URLs

URL	http://www.coris.noaa.gov/monitoring/
URL Type	Online Resource
File Resource Format	HTML

Description	NOAA National Coral Reef Monitoring Program website.

URL	http://www.pifsc.noaa.gov/cred/pacific_ramp.php
URL Type	Online Resource
File Resource Format	PHP
Description	Official NOAA Coral Reef Ecosystem Program website, Pacific Reef Assessment and Monitoring Program (Pacific RAMP).

URL	http://cdiac.ornl.gov/oceans/Handbook_2007.html
URL Type	Online Resource
File Resource Format	HTML
Description	Guide to Best Practices for Ocean CO2 Measurements (Dickson et al, 2007). The "Guide" all in one PDF is available on this website as well.

URL	http://www.pifsc.noaa.gov/cred/ocean_acidification.php
URL Type	Online Resource
File Resource Format	PHP
Description	Pacific Islands Fisheries Science Center, Coral Reef Ecosystem Program official website, Ocean Acidification page.

URL	https://galapagosscience.files.wordpress.com/2014/12/chuki_niskin.jpg
URL Type	Browse Graphic
File Resource Format	JPG
Description	Example of a SCUBA diver collecting a water sample underwater using a Niskin Bottle. Source: Galapagos Science Center, El-Nino Research Cruise News Blog, https://galapagosscience.wordpress.com/.

URL	
URL Type	
File Resource Format	
Description	

URL	
URL Type	
File Resource Format	
Description	

URL	
URL Type	
File Resource Format	
Description	

Activity Log

Activity Time	
Activity Type	
Responsible Party	
Description	

Activity Time	
Activity Type	
Responsible Party	
Description	

Activity Time	
Activity Type	
Responsible Party	

Description	

Issues

Issue Date	
Author	
Issue	

Issue Date	
Author	
Issue	

Issue Date	
Author	
Issue	

Technical Environment

Description	Microsoft Access 2010

Data Quality

Representativeness	
Accuracy	Accuracy of laboratory analysis is explained in detail in Dickson et al (2007).
Analytical Accuracy	
Quantitation Limits	

Bias	
Comparability	Since the carbonate system can vary on a diurnal scale and not all samples are taken at the exact same time of day, considering the time a sample was taken may be important for some analyses. However, because all samples are taken between 8:00 AM and 4:00 PM, variation due to diurnal change is expected to be small.
Completeness Measure	
Precision	
Analytical Precision	
Field Precision	
Sensitivity	
Detection Limit	
Completeness Report	All analyzed samples are included. -9.99-E29 values in the data, where they exist, indicate that this observation/analysis was not conducted for the sample record where it appears.
Conceptual Consistency	The data are very consistent, sample collection and processing protocols are adhered to very rigorously, both in the field and in the lab.
» Quality Control Procedures Employed	PMEL conducts quality assurance and quality control on their analyses; the precision and accuracy of DIC analyses are on the order of ± 0.05% and TA analyses are on the order of ± 0.1% in a laboratory setting. Data quality flags are provided by NOAA Pacific Marine Environmental Laboratory (PMEL) and included in the dataset. These flags indicate if something went wrong with the analytical equipment or with the processing of the samples. PMEL uses the World Ocean Circulation Experiment (WOCE) data quality flag system, where '2's correspond to good values, '3's to questionable data, and '4's to bad data. Most water samples collected by the NOAA Coral Reef Ecosystem Program (CREP) and analyzed by PMEL in this dataset received a '2' data quality flag and the remainder were flagged as questionable ('3').

Data Management

» Have Resources for Management of these Data Been Identified?	Yes
» Approximate	Unknown

Percentage of Budget for these Data Devoted to Data Management	
» Do these Data Comply with the Data Access Directive?	Yes
» Is Access to the Data Limited Based on an Approved Waiver?	No
» If Distributor (Data Hosting Service) is Needed, Please Indicate	
» Approximate Delay Between Data Collection and Dissemination	Unknown
» If Delay is Longer than Latency of Automated Processing, Indicate Under What Authority Data Access is Delayed	
» Actual or Planned Long-Term Data Archive Location	NCEI-MD
» Approximate Delay Between Data Collection and Archiving	Unknown
» How Will the Data Be Protected from Accidental or Malicious Modification or Deletion Prior to	NOAA IRC and NOAA Fisheries ITS resources and assets.

Receipt by the Archive?	

Lineage

» Lineage Statement	NOAA Coral Reef Ecosystem Program (CREP) assembles carbonate chemistry information from discrete seawater samples analyzed for two parameters: 1) Dissolved Inorganic Carbon (DIC), which in some literature is defined as Total Carbon (CT), and 2) Total Alkalinity (TA or AT). The carbonate system is influenced by seawater salinity, temperature, pressure, and the dissolved nutrients silicate (SiO44-) and phosphate (PO43-). All carbonate system collection and measurement methodologies follow the protocols accepted by the greater scientific community and outlined in Dickson et al. (2007)

Sources

Citation Title	Dickson et al (2007), SOP 1: Water Sampling for the parameters of the oceanic carbon dioxide system
Originator/Publisher	
Publish Date	
Extent Type	
Extent Start Date/Time	
Extent End Date/Time	
Citation URL	http://cdiac.ornl.gov/ftp/oceans/Handbook_2007/sop01.pdf
Scale Denominator	

Citation Title	Dickson et al (2007), SOP 2: Determination of total dissolved inorganic carbon in sea water
Originator/Publisher	
Publish Date	
Extent Type	
Extent Start Date/Time	
Extent End Date/Time	
Citation URL	http://cdiac.ornl.gov/ftp/oceans/Handbook_2007/sop02.pdf
Scale Denominator	

Citation Title	Dickson et al (2007), SOP 3b: Determination of total alkalinity in sea water using an open-cell titration
Originator/Publisher	
Publish Date	

Extent Type	
Extent Start Date/Time	
Extent End Date/Time	
Citation URL	http://cdiac.ornl.gov/ftp/oceans/Handbook_2007/sop03b.pdf
Scale Denominator	

Citation Title	Dickson, A.G., Sabine, C.L. and Christian, J.R. (Eds.) 2007. Guide to best practices for ocean CO2 measurements. PICES Special Publication 3, 191 pp.
Originator/Publisher	
Publish Date	
Extent Type	
Extent Start Date/Time	
Extent End Date/Time	
Citation URL	http://cdiac.ornl.gov/ftp/oceans/Handbook_2007/Guide_all_in_one.pdf
Scale Denominator	

Citation Title	Inorganic Carbon Sampling: Planning and Sample Collection
Originator/Publisher	NOAA Pacific Marine Environmental Laboratory (PMEL)
Publish Date	2010-05-14
Extent Type	
Extent Start Date/Time	
Extent End Date/Time	
Citation URL	http://www.pmel.noaa.gov/co2/files/dic_sample_technique_revised_5-17-10.pdf
Scale Denominator	

Citation Title	
Originator/Publisher	
Publish Date	
Extent Type	
Extent Start Date/Time	

Extent End Date/Time	
Citation URL	
Scale Denominator	

Citation Title	
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Scale Denominator	

Citation Title	
Originator/Publisher	
Publish Date	
Extent Type	
Extent Start Date/Time	
Extent End Date/Time	
Citation URL	
Scale Denominator	

Process Steps

Process Step Number	1
» Description	Discrete water samples are collected according to the protocol established by the NOAA Pacific Marine Environmental Laboratory (PMEL).
Process Date/Time	
Process Contact	Charles W Young
Phone (Voice)	
Email Address	charles.young@noaa.gov

Source	Inorganic Carbon Sampling: Planning and Sample Collection

Process Step Number	2
» Description	NOAA Coral Reef Ecosystem Program (CREP) collects supplementary salinity, temperature, and pressure values by deploying a Seabird Electronics SBE-19plus CTD in concert with every discrete seawater sample collection.
Process Date/Time	
Process Contact	Charles W Young
Phone (Voice)	
Email Address	charles.young@noaa.gov
Source	

Process Step Number	3
» Description	NOAA Pacific Marine Environmental Laboratory (PMEL) supports NOAA Coral Reef Ecosystem Program's (CREP's) carbonate chemistry sampling through the laboratory analysis of dissolved inorganic carbon (DIC) and total alkalinity (TA), provision of the sample bottles and transport cases, and technical consultation. The source document contains the protocols that PMEL uses to analyze water samples for DIC and TA.
Process Date/Time	
Process Contact	NOAA Pacific Marine Environmental Laboratory (PMEL)
Phone (Voice)	
Email Address	
Source	Dickson, A.G., Sabine, C.L. and Christian, J.R. (Eds.) 2007. Guide to best practices for ocean CO2 measurements. PICES Special Publication 3, 191 pp.

Process Step Number	4
» Description	The Total Alkalinity (TA) analysis employs a two-stage, potentiometric, open-cell titration using coulometrically analyzed HCl.
Process Date/Time	
Process Contact	
Phone (Voice)	
Email Address	
Source	Dickson et al (2007), SOP 3b: Determination of total alkalinity in sea water using an open-cell titration

Process Step Number	
» Description	
Process Date/Time	
Process Contact	
Phone (Voice)	
Email Address	
Source	

Process Step Number	
» Description	
Process Date/Time	
Process Contact	
Phone (Voice)	
Email Address	
Source	

Process Step Number	
» Description	
Process Date/Time	
Process Contact	
Phone (Voice)	
Email Address	
Source	

FAQs

Date	

Author	
Question	
Answer	

Downloads

» URL	http://accession.nodc.noaa.gov/0131502
File Name	OA_H2OSamples-MetadataEA.csv
Description	Data dictionary for the water chemistry dataset described herein, which includes a description of each column and it's domain values contained in the CSV file.
File Date/Time	2015-09-08 00:00:00
File Type	csv (comma-separated values)
FGDC Content Type	Other Documents
File Size	14 KB
Application Version	
Compression	
Review Status	

» URL	http://accession.nodc.noaa.gov/0131502
File Name	dic_sample_technique_revised_5-17-10.pdf
Description	Discrete water sample collection protocol, established by the NOAA Pacific Marine Environmental Laboratory (PMEL).
File Date/Time	2010-05-14 00:00:00
File Type	PDF
FGDC Content Type	Other Documents
File Size	394 KB
Application Version	
Compression	
Review Status	

» URL	http://accession.nodc.noaa.gov/0131502
File Name	Guide_all_in_one.pdf
Description	Dickson et al. (2007) protocols, Guide to best practices for ocean CO2 measurements. PICES Special Publication 3, 191 pp. ("Guide" in one PDF file).
File Date/Time	2007-10-12 00:00:00
File Type	PDF
FGDC Content Type	Other Documents
File Size	2996 KB
Application Version	
Compression	
Review Status	

» URL	http://accession.nodc.noaa.gov/0157714
File Name	CRED_NCRMP_Data2013-H2O-HA.csv
Description	Water quality data from water samples collected by the NOAA Coral Reef Ecosystem Program at sites across the Hawaiian Archipelago in 2013.
File Date/Time	
File Type	csv (comma-separated values)
FGDC Content Type	Downloadable Data
File Size	
Application Version	
Compression	
Review Status	

» URL	http://accession.nodc.noaa.gov/0160330
File Name	CRED_NCRMP_Data2015-H2O-NWHI.csv
Description	Water quality data from water samples collected by the NOAA Coral Reef Ecosystem Program at sites across the Northwestern Hawaiian Islands in 2015.
File Date/Time	
File Type	csv (comma-separated values)

FGDC Content Type	Downloadable Data
File Size	
Application Version	
Compression	
Review Status	

» URL	
File Name	
Description	
File Date/Time	
File Type	
FGDC Content Type	
File Size	
Application Version	
Compression	
Review Status	

» URL	
File Name	
Description	
File Date/Time	
File Type	
FGDC Content Type	
File Size	
Application Version	
Compression	
Review Status	

» URL	
File Name	
Description	
File Date/Time	
File Type	
FGDC Content Type	
File Size	
Application Version	
Compression	
Review Status	

Child Items

Rubric scores updated every 15m

Score	Type	Title
100	Entity (ENT)	Water Chemistry Entity

Related Items

Type	Title
Data Set (DS)	National Coral Reef Monitoring Program: Water Chemistry of the Coral Reefs in American Samoa from Water Samples collected since 2015
Data Set (DS)	National Coral Reef Monitoring Program: Water Chemistry of the Coral Reefs in the Mariana Archipelago from Water Samples collected in 2014
Data Set (DS)	National Coral Reef Monitoring Program: Water Chemistry of the Coral Reefs in the Pacific Remote Island Areas from Water Samples collected since 2014
Data Set (DS)	Pacific Reef Assessment and Monitoring Program: Water Chemistry of the Coral Reefs of U.S. Pacific Reefs from Water Samples collected since <<<YYYY>>>

Catalog Details

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